# Industrial Power Supplies

**TFP-Series**

## Innovative and Powerful Features!

- **Robust and compact low profile metal case for mounting in flat racks**
- **Low heat dissipation and a high efficiency of 92% typical**
- **Worlwide Safety approval package.**
- **ATEX certification and IECEx test report (opt. EX)**
- **Wide AC and DC input voltagee range 85 – 264 VAC and 90 – 280 VDC**
- **Industrial operating temperature range: –25°C to +70°C**
- **Active isolation diode**
- **Mains current with power factor >97%[1)]**
- **Adjustable output voltage**
- **Protection agains short-circuit, overvoltage and over-temperature**
- **Power OK signal, Remote On/Off**
- **Extended functional features (opt.)**
- **Wall mounting (opt.)**
- **3-year product warranty**

EMC LVD | IEC 60950-1 | UL 60950-1 UL 508 UL 60079-15 | ATEX II3G IECEX


The TFP series is designed for mounting in shallow electric control cabinets with low profile depth and DIN RAIL or wall mounting. The unique thermo-mechanical construction combines optimized heat transfer of power components and high mechanical ruggedness for operation in harsh mechanical and ambient temperature environments. Most efficient circuit topologies keep the heat dissipation very low and the conversion efficiency high. The compact size is a further feature of this highly reliable power supply. The power supply can deliver high overload currents for limited periods and provides very high currents for short durations to trip fuses to achieve selective fuse breaking while supplying various loads. A built in active Isolation Diode allows applications in power supply systems with bus structures.

This power supply line can also integrate a wide range of functional features for additional system solutions:

**Current share module** for true current sharing with internal house keeping parameters through CAN, LAN or Optocoupler
**Battery charger module** to convert the unit into a battery charger

In addition there are some external modules for USP purposes:

**USP modules** for operation with UltraCap or Battery

## Models

| Order Code | Output Power (Pmax) | [3)] Output Voltage (Vnom) | [4)] Output Current (Imax) |
|---|---|---|---|
| **TFP 250–124[2)]** | 250 W | 24 VDC | 10 A |
| **TFP 500–124[2)]** | 500 W | 24 VDC | 20 A |
| **TFP 750–124[2)]** | 750 W | 24 VDC | 30 A |

[1)] TFP 250-124 only >90% at 230 Vac all others 97%
[2)] For ATEX / IECEx compliant model add appendix -EX to order code.
[3)] Output voltage adjustable 24–28,8 VDC, 48–60 VDC and 60–74 VDC
[4)] Max. current at nominal output voltage and operating temperature up to 60 °C max.

## Input Specifications

| | | | |
|---|---|---|---|
| Input voltage range | | AC input:<br>DC input: | 85 – 264 VAC universal input<br>90 – 280 VDC (external fuse or circuit breaker required) |
| Input voltage frequency | | | 45 – 65 Hz |
| Harmonic limits | | | EN 61000-3-2, Class A (for limited output power) |
| Holdup time | | 85 VAC<br>184 VAC | 20 ms typ.<br>20 ms typ. |
| Inrush current | | 115 VAC<br>230 VAC | < 15 A<br>< 30 A |
| Recommended circuit breaker, characteristic B | | – TFP | TBD |
| Standby Power (external ON/OFF activated) | | 250 W model:<br>500 W model:<br>750 W model: | 3W<br>5W<br>7W |
| Start-up delay | | | 400 ms typ. |
| Efficiency (at nominal load) | | 115 VAC<br>230 VAC | 91.5 % typ.<br>93 % typ. |

## Output Specifications

| | | | |
|---|---|---|---|
| Output voltage adj. range | | – 24 VDC models:<br>– 48 VDC models:<br>– 72 VDC models: | 24 – 28,8 VDC (SELV voltage)<br>48 – 60 VDC<br>60 – 74 VDC<br>At output voltage higher than nominal output voltage max. output current has to be reduced accordingly, in order not to exceed max. output power. |
| Regulation | – Input variation<br>– Load variation (10–90 %) | | 0.5 % max.<br>1.0 % max. |
| Ripple and Noise (20MHz bandwidth) | | | < 100 mV pk-pk |
| Electronic short circuit protection | | | constant current, automatic recovery see Fig. 2 |
| Output overvoltage protection | | – 24 VDC models:<br>– 48 VDC models:<br>– 72 VDC models: | < 35 V<br>< 70 V<br>< 100 V |
| Overload protection | | | electronic overload protection |
| Overtemperature protection | | | switch off at overtemperature, automatic restart |
| Power back immunity | | – 24 VDC models:<br>– 48 VDC models:<br>– 72 VDC models: | 30 V<br>TBD<br>TBD |
| Status indicator | | | dual color LED (green: DC ok, red: DC off) |
| Power OK signal | – trigger threshold:<br>– active output signal: (reference to –Vout) TBD<br>– relay output | – 24 VDC models:<br>– 48 VDC models:<br>– 72 VDC models:<br>– 12 VDC models:<br>– 24 VDC models: | 21.5 – 22.5 V<br>TBD<br>TBD<br>11.0 V ±1.0 V<br>(20 mA max. for TSP 070, 40 mA max. for TSP 140)<br>22.0 V ±2.0V / 20 mA max.<br>DC OK = contact closed<br>rated: 30 VDC/1.0 A for 24 VDC models<br>rated: TBD for 48 VDC model<br>rated: TBD for 72 VDC models |

## General Specifications

| | | |
|---|---|---|
| Max. capacitive load | | unlimited |
| Temperature range | – Operating | –25°C to +70°C max.<br>(optional –40°C to +70°C) |
| | – Storage | –25°C to +85°C |
| Power derating | | 3 %/K above 60°C |
| Cooling | | convection cooling, no internal fan |
| Humidity (non condensing) | | 95 % rel. H max. |
| Pollution degree | | 2 |
| Temperature coefficient | | 0.02 %/K |
| Reliability, calculated MTBF (at +25°C acc. to IEC 61709) | | >500'000 Mio h |
| Remote On/Off | | by ext. contact.<br>DC on: -S contact open<br>DC off: -S connectetd via 1Kohm to GND |
| Isolation | | 4250 VDC, Input - output (without earth connected) |
| Safety standards | – Information technology equipment | IEC/EN 60950-1, UL 60950-1, CSA-C22.2 No. 60950-1-03 |
| | – Industrial control equipment | UL 508, CSA-C22.2 No. 107 |
| | – Electrical equipment for machines | EN 60204 |
| | – Electronic equipment for power installation | EN 50178 |
| | – Safety transformers for SMPS | EN 61558-2-4, EN 61558-2-4 |
| | – Control equipment for hazardous location | UL 60079-15<br>(Class I, Division 2, Groups A,B,C,D AEx n C II C T4 U)<br>IEC/EN 60079-15 (Class I, Zone 2, EEx nC II C T4 U),<br>(Ex) II3G EEX nAC IIC T4 (T3 with limited power) |
| Safety approvals and certifications | – CB report | for IEC/EN 60950-1<br>www.tracopower.com/products/tfp-cb.pdf pending |
| | – UL approvals | UL 60950-1 rec. File: e181381, UL 508C listed File: e210002<br>www.ul.com -> certifications |
| | – CSA certification | (file no. 219759) for UL 60950-1, UL 508, UL 60079-15-02, ANSI/ISA 12.12.01, CSA-22.2 No. 60950-1-03, CSA C22.2 No. 107, CSA 60079-15-02 |
| | – (Ex) II3G ATEX 94/9/EC | certificate no. EPS 12 ATEX 1 424 X (option -EX only)<br>www.tracopower.com/products/tfp-atex.pdf |
| | – IECEx test report | for IEC 60079-15<br>www.tracopower.com/products/tfp-iecex.pdf pending |
| | – BG certification | EN 60950-1, EN 60204-1, EN 61558-2-16, EN 50178<br>www.tracopower.com/products/tfp-bg.pdf pending |
| | – Certification documents | www.tracopower.com/overview/tfp |
| Class of protection | | safety class I (IEC 536) |
| Degree of protection | | IP 20 (IEC/EN 60529) |
| Electromagnetic compatibility (EMC), Emissions | | EN 61000-6-3, EN 61204-3 |
| | – Conducted RI suppression on input | EN 55011 class B, EN 55022 class B, |
| | – Radiated RI suppression | EN 55011 class B, EN 55022 class B, |
| Electromagnetic compatibility (EMC), Immunity | | EN 61000-6-2, EN 61204-3 |
| | – Electrostatic discharge (ESD) | IEC / EN 61000-4-2 — 4 kV / 8 kV — criteria A |
| | – Radiated RF field immunity | IEC / EN 61000-4-3 — 20 V / m — criteria A |
| | – Electrical fast transient / burst immunity | IEC / EN 61000-4-4 — 2 kV — criteria B |
| | – Surge immunity | IEC / EN 61000-4-5 — 1 kV / 2 kV — criteria B |
| | – Immunity to conducted RF disturbances | IEC / EN 61000-4-6 — 10 V — criteria A |
| | – Power frequency field immunity | IEC / EN 61000-4-8 — 100 A / m — criteria A |
| | – Mains voltage dips and interruptions | IEC / EN 61000-4-11 — criteria B/C |
| | – Voltage sag immunity | SEMI F47<br>www.tracopower.com/products/TFP_SemiF47.pdf pending |

## General Specifications

| | | |
|---|---|---|
| Environment | – Vibration acc. IEC 60068-2-6;<br>– Shock acc. IEC 60068-2-27 | 3 axis, sine sweep, 10 – 55 Hz, 2 g, 11 oct/min<br>3 axis, 25 g half sine, 11 ms |
| Enclosure material | | aluminium (chassis) / stainless steel (cover) |
| Mounting | – DIN-rail mounting<br><br>– Wall mounting (option) | for DIN-rails as per EN 50022-35x15/7.5<br>(snap-on with self-locking spring)<br>with wall mounting bracket - see page 6 |
| Connection | | detachable screw terminals (plugs included)<br>2 terminals per output |
| Remote On/Off connection | – 2 pin molex male terminal KK series | mating connector information (cable not included)<br>www.tracopower.com/products/tfp-rc-cable.pdf |



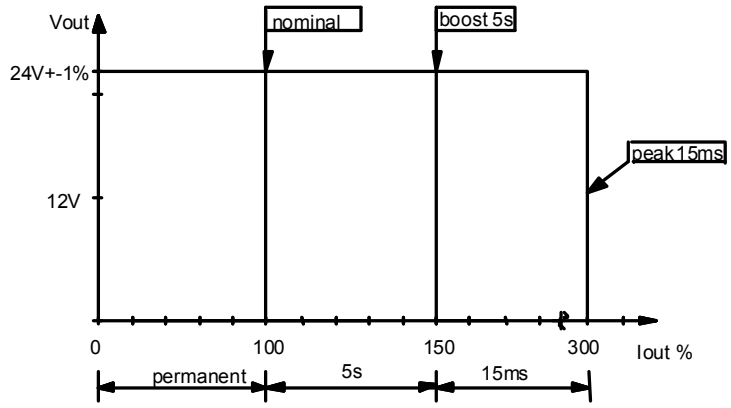



**Fig 1** Current capability

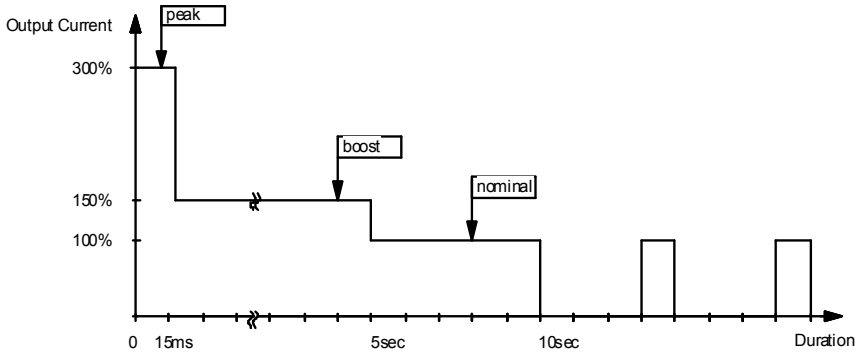



**Fig 2** Output Current at short circuit

Explanation of Current capability:

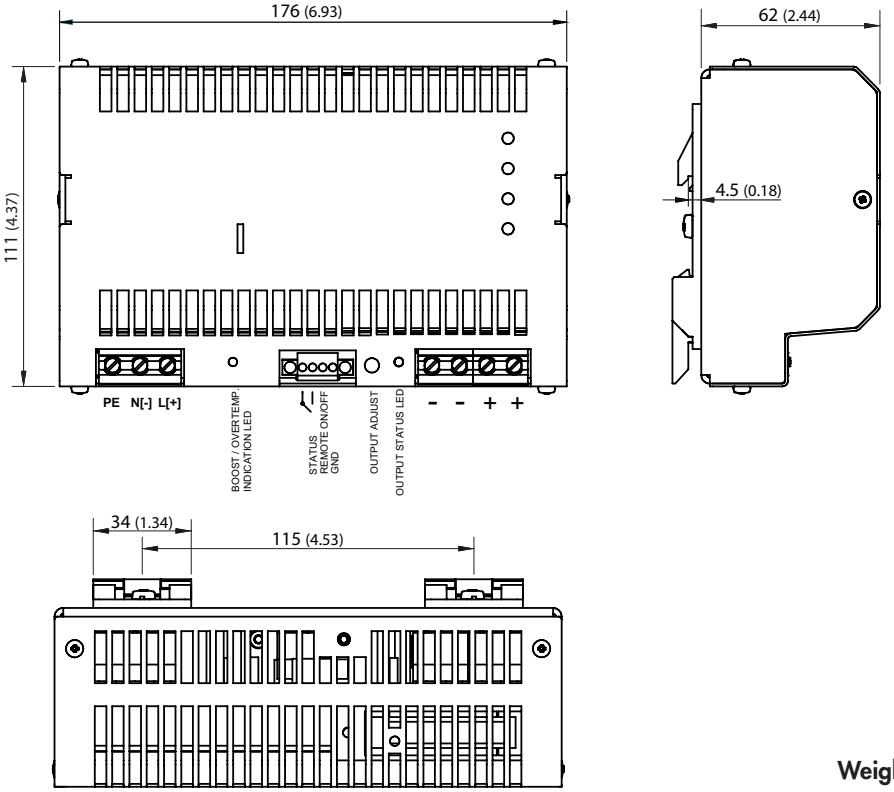
**Peak Current:** This current is used to deliver a high current pulse for a very short time duration that is sufficient to trip an appropriately selected magnetic trip switch or blow a DC bus fuse.

**Boost Current:** This current is provided for several seconds to absorb temporary and transient peak load demands such as: the startup of motors, or the startup of large capacitive loads, or the start up or On/Off switching of DC/DC converters, or other infrequent repetitive overload demands.

**Nominal Current:** This current is supplied on a continuous basis according to the rating diagram.

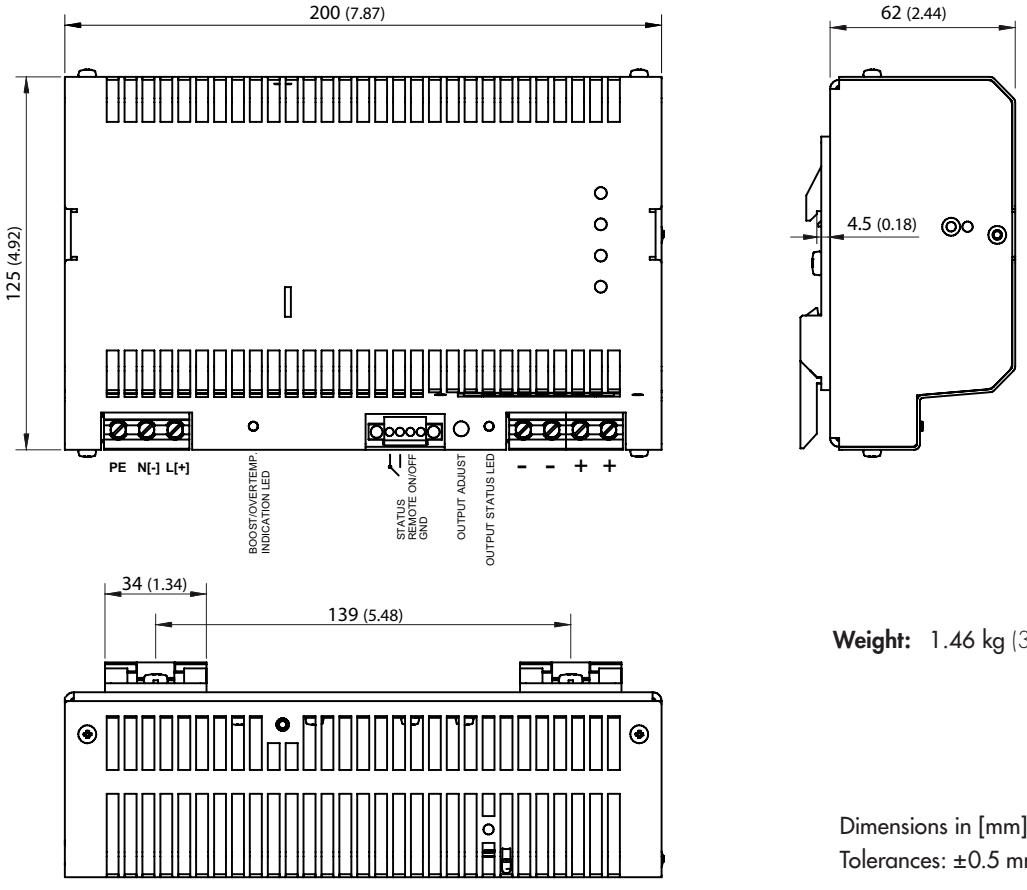
## Outline Dimensions

**Model:**
**TFP 250**




**Weight:** 1.1 kg (2.4lb)

**Model:**
**TFP 500**

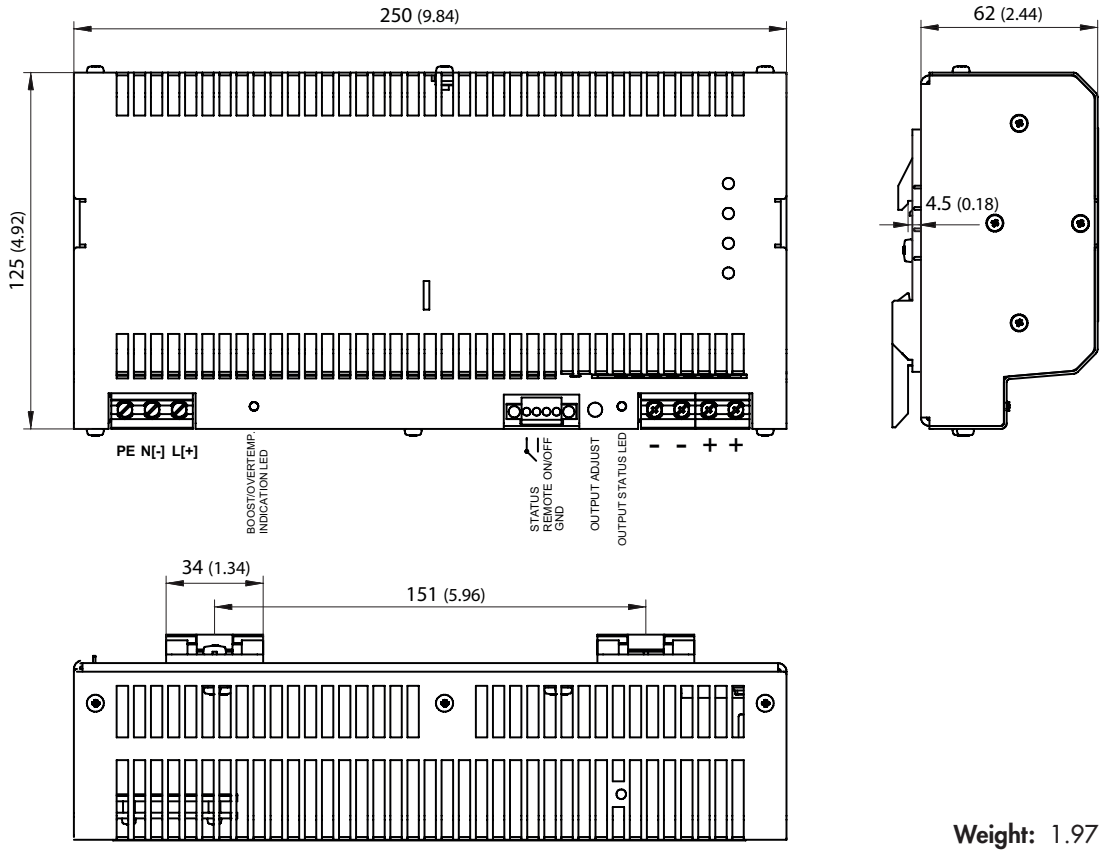



**Weight:** 1.46 kg (3.2lb)

Dimensions in [mm], () = inch
Tolerances: ±0.5 mm (±0.02)

## Outline Dimensions

**Model:**
**TFP 750**

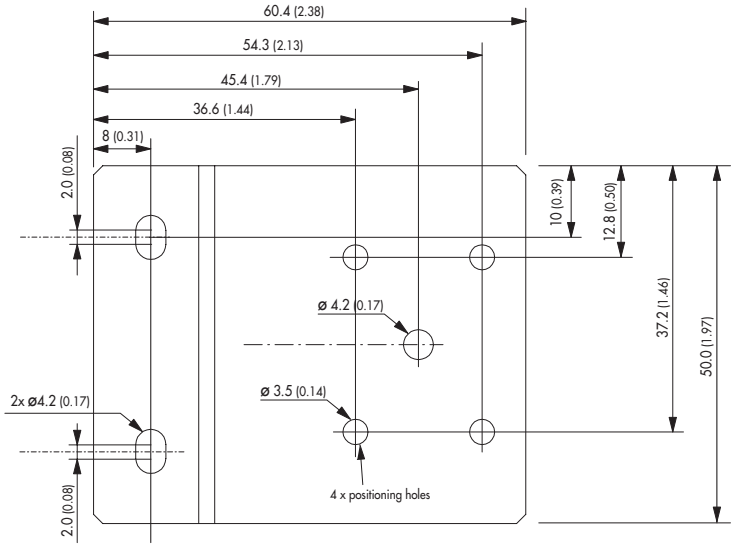



**Weight:** 1.97 kg (4.30lb)

## TSP–WMK Wall Mounting Bracket

| Ordercode of Kit | For Models | Content of Kit |
|---|---|---|
| TFP-WMK01 | TFP 250, TFP 500, TFP 750 | 2 brackets |

**TFP-WMK01**




Dimensions in [mm], ( ) = Inch
Tolerances: ±0.5 mm (±0.02)